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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/658,696	09/08/2000	Sung Bae Moon	C34037/119442	3637

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EXAMINER	
HAN, CLEMENCE S	
ART UNIT	**PAPER NUMBER**
2665	

DATE MAILED: 07/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/658,696	MOON, SUNG BAE	
	Examiner	Art Unit	
	Clemence Han	2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7,9,10 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7,9,10 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 12 is objected to because of the following informalities: There is a typographical error in line 8, "QSPK". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claim 1, 2, 7, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney (US 5,838,732) in view of Xin et al. (US 6,268,818) and further in view of Applicant's Admitted Prior Art.

Regarding to claim 1, Carney teaches an RF transmitting device of a mobile radio communication base station system in a CDMA system having a plurality of channel cards providing baseband signal on I/Q channels for multi-frequency assignment and a transmitting antenna, said RF transmitting device comprising: a digital unit 22, 23 for digital modulating the baseband signal on the I/Q channels by each frequency assignment provided from said plurality of channel cards, coupling 25 the digital modulated signals by the frequency assignment, and then converting the digital modulated signal into an analog signal 27 and a transmitting unit for amplifying 29 the RF signal to an arbitrary transmitting output level and

transmitting 32 the amplified signal via the transmitting antenna. Carney teaches the analog frequency up-converting unit 28 but not the details of the unit. Xin teaches an analog frequency up-converting unit for primarily up-converting the analog-converted multi-frequency assignment signal in the digital unit into an IF signal 818 and a secondary up-converting the converted IF signal into an RF signal 824, wherein said analog frequency up-converting unit comprises a first frequency up-converter 818 for up-converting the coupled multi-frequency assignment analog signal outputted from said digital unit into an arbitrary IF signal; a band-pass filter 822 for band-pass filtering the coupled multi-frequency assignment IF signal outputted from said first frequency up-converter to an arbitrary frequency bandwidth; and a second frequency up-converter 824 for converting the IF signal filtered in said band-pass filter into an RF signal to thereby output the converted RF signal to said transmitting unit. It would have been obvious to one skilled in the art to modify Carney to have the analog frequency up-converting unit as taught by the Xin in order to prepare the signal for the RF transmission (Column 1 Line 49-65). Carney in view of Xin, however, does not explicitly teach said band-pass filter is an SAW filter having the bandwidth of 3.75MHz. AAPA discloses using three SAW filters each having bandwidth of 1.25MHz (Page 5). It would have been obvious to one skilled in the art to modify Carney in view of Xin to use an

SAW filter having the bandwidth of 3.75MHz which is a multiple of 1.25MHz taught by AAPA in order to accommodate the total bandwidth for the coupled signals from the specific number of channel cards.

Regarding to claim 2, Carney teaches a plurality of digital modulators for executing a QPSK modulation for each of the CDMA baseband signals outputted from said plurality of channel cards by the frequency assignment 22, 23; a coupler 25 for coupling the each frequency assignment signals modulated in said plurality of digital modulators; and a D/A converter 27 for converting the coupled each frequency assignment QPSK modulated signal in said coupler 25 into an analog signal to thereby output the converted analog signal to said analog frequency up-converting unit 28.

Regarding to claim 7, Xin teaches the first frequency up-converter comprises: a first local oscillator 820 for generating a fixed local frequency to convert the analog signal inputted into the IF signal; and a first mixer 818 for mixing the fixed local frequency signal generated from said first local oscillator and the analog signal inputted and converting the mixed result into the IF signal having a constant center frequency of the multi-frequency assignment band.

Regarding to claim 9, Xin teaches the second frequency up-converter comprises: a second local oscillator 826 for generating a fixed local frequency to

convert the filtered IF signal inputted into the RF signal; and a second mixer 824 for mixing the fixed local frequency signal generated from said second local oscillator and the IF signal and converting the mixed result into the RF signal having a constant center frequency of the multi-frequency assignment band.

Regarding to claim 10, Carney teaches an RF transmitting device of a mobile radio communication base station system in a CDMA system having a plurality of channel cards providing baseband signal on I/Q channels for multi-frequency assignment and a transmitting antenna, said RF transmitting device comprising: a plurality of digital modulator 22, 23 for performing a QPSK modulation for each of the CDMA baseband signal outputted from the plurality of channel cards by each frequency assignment; a coupler 25 for coupling the digital modulated signals by the frequency assignment in the plurality of digital modulators by the frequency assignment; a D/A converter 27 for converting the coupled multi-frequency assignment QPSK modulated signal in said coupler into an analog signal and outputting the converted analog signal to an analog frequency up-converting unit; said transmitting unit for amplifying 29 the up-converted RF signal to an arbitrary transmitting output level and transmitting 32 the amplified signal via the transmitting antenna. Carney teaches the analog frequency up-converting unit 28 but not the details of the unit. Xin teaches said analog

frequency up-converting unit comprising a first frequency up-converter 818 for converting the multi-frequency assignment analog modulated signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for filtering the up-converted multi-frequency assignment IF signal in said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824 for converting the filtered multi-frequency assignment IF signal in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit. It would have been obvious to one skilled in the art to modify Carney to have the analog frequency up-converting unit as taught by the Xin in order to prepare the signal for the RF transmission (Column 1 Line 49-65). Carney in view of Xin, however, does not explicitly teach said band-pass filter is an SAW filter having the bandwidth of 3.75MHz. AAPA discloses using three SAW filters each having bandwidth of 1.25MHz (Page 5). It would have been obvious to one skilled in the art to modify Carney in view of Xin to use an SAW filter having the bandwidth of 3.75MHz which is a multiple of 1.25MHz taught by AAPA in order to accommodate the total bandwidth for the coupled signals from the specific number of channel cards.

4. Claim 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney in view of Xin et al. and Applicant's Admitted Prior Art and further in view of Chester et al. (U.S. Patent 5,930,301).

Regarding to claim 3, Xin teaches the digital signal processing blocks 804, 810; a digital local oscillator for outputting arbitrary local frequencies having the phase difference of 90 (Column 11 Line 21 and 28); a plurality of mixers 806, 812 for mixing each of the local frequencies having the phase of 0 and 90 generated from said local oscillator and each of the baseband signals on the I/Q channels and an adder 808 for adding the mixed signals on the I and Q channels in said plurality of mixers 806, 812. Carney in view of Xin and AAPA, however, does not explicitly teach that the digital signal processing blocks 804, 810 are comprised of low-pass filters and interpolation filters. Chester teaches the digital signal processing blocks comprised of low-pass filters 200 and interpolation filters 11. It would have been obvious to one skilled in the art to modify Carney in view of Xin and AAPA to include the low-pass filters and interpolation filters as taught by Chester in order to reduce distortion (Column 1 Line 47 -49).

Regarding to claim 4, AAPA discloses 1.25 MHz is the preferred channel bandwidth (Page 5).

5. Claim 5 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carney in view of Xin et al. and Applicant's Admitted Prior Art and further in view of Antonio et al. (U.S. Patent 6,483,817).

Regarding to claim 5, Carney teaches coupled 25 outputs from the digital modulators 22, 23 outputted to the D/A converter 27. Carney in view of Xin and AAPA, however, does not explicitly teach serially coupling the outputs from the digital modulators. Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Column 20 Line 3-5, Figure 13). It would have been obvious to one skilled in the art to modify Carney in view of Xin and AAPA to couple the outputs from the modulators serially as taught by Antonio in order to reduce the complexity of the coupler (Column 3 Line 34).

Regarding to claim 12, Carney teaches an RF transmitting device of a mobile radio communication base station system in a CDMA system having a plurality of channel cards providing baseband signal on I/Q channels for multi-frequency assignment and a transmitting antenna, said RF transmitting device comprising: a plurality of digital modulator 22, 23 by frequency assignment for executing a QPSK modulation for each of the CDMA baseband signal outputted by said plurality of channel cards and coupling 25 the QPSK modulated signal, to there output a digital modulated signal in a multi-frequency assignment band; a

D/A converter 27 for converting the coupled multi-frequency assignment QPSK modulated signal outputted from digital modulator into an analog signal to thereby output the converted analog signal to an analog frequency up-converting unit 28; said transmitting unit for amplifying 29 the up-converted RF signal to an arbitrary transmitting output level and transmitting 32 the amplified signal via the transmitting antenna. Carney teaches the analog frequency up-converting unit 28 but not the details of the unit. Xin teaches said analog frequency up-converting unit comprising a first frequency up-converter 818 for converting the coupled multi-frequency assignment analog signal outputted from said D/A converter into an arbitrary IF signal, a band-pass filter 822 for band-pass filtering the coupled multi-frequency assignment IF signal outputted from said first frequency up-converter to an arbitrary bandwidth, and a second frequency up-converter 824 for converting the multi-frequency assignment IF signal filtered in said band-pass filter into an RF signal to thereby output the converted RF signal to a transmitting unit. It would have been obvious to one skilled in the art to modify Carney to have the analog frequency up-converting unit as taught by the Xin in order to prepare the signal for the RF transmission (Column 1 Line 49-65). Carney in view of Xin, however, does not explicitly teach said band-pass filter is an SAW filter having the bandwidth of 3.75MHz. AAPA discloses using three SAW filters each having

bandwidth of 1.25MHz (Page 5). It would have been obvious to one skilled in the art to modify Carney in view of Xin to use an SAW filter having the bandwidth of 3.75MHz which is a multiple of 1.25MHz taught by AAPA in order to accommodate the total bandwidth for the coupled signals from the specific number of channel cards. Carney teaches coupled 25 outputs from the digital modulators 22, 23 outputted to the D/A converter 27. Carney in view of Xin and AAPA, however, does not explicitly teach serially coupling the outputs from the digital modulators. Antonio teaches the serially coupled outputs from the modulators outputted to the D/A converter (Column 20 Line 3-5, Figure 13). It would have been obvious to one skilled in the art to modify Carney in view of Xin and AAPA to couple the outputs from the modulators serially as taught by Antonio in order to reduce the complexity of the coupler (Column 3 Line 34).

Response to Arguments

6. Applicant's arguments with respect to claim 1-5, 7, 9, 10 and 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Clemence Han whose telephone number is

(571) 272-3158. The examiner can normally be reached on Monday-Thursday 7 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C. H.

Clemence Han
Examiner
Art Unit 2665

STEVEN NGUYEN
PRIMARY EXAMINER